

WHAT IS CLAIMED IS:

1. A positioning apparatus comprising:
 - a chamber;
 - a substituting unit for substituting a gas in said chamber from a first gas to a second gas;
 - a static pressure gas bearing provided in said chamber;
 - a gas supply unit for supplying the second gas to said static pressure gas bearing; and
 - a control unit for controlling said gas supply unit to supply the second gas to said static pressure gas bearing when said substituting unit substitutes the gas in said chamber from the first gas to the second gas.
2. The apparatus according to claim 1, further comprising an evacuating unit for evacuating said chamber by exhausting the gas therefrom when substituting the gas in said chamber from the first gas to the second gas.
3. The apparatus according to claim 2, wherein said gas supply unit supplies the second gas to said static pressure gas bearing before start of exhausting the gas in said chamber.
4. The apparatus according to claim 2, wherein said gas supply unit supplies the second gas to said static pressure gas bearing simultaneously with exhausting the gas in said chamber.
- 25 5. The apparatus according to claim 2, wherein said gas supply unit supplies the second gas to said static pressure

gas bearing after start of exhausting the gas in said chamber.

6. The apparatus according to claim 1, further comprising a bearing exhaust unit for exhausting the gas of said static pressure gas bearing through a pipe connected thereto.

5 7. The apparatus according to claim 1, wherein the second gas is He.

8. The apparatus according to claim 1, wherein said chamber is of an exposure apparatus.

9. A positioning apparatus comprising:
10 a chamber;

a substituting unit for exhausting a first gas from said chamber and introducing a second gas into said chamber;

a static pressure gas bearing provided in said chamber;

15 a gas supply pipe for supplying a working gas to said static pressure gas bearing; and

a bearing exhaust unit for exhausting a gas of said static pressure gas bearing through said gas supply pipe.

10. The apparatus according to claim 9, wherein the second gas is He.

20 11. The apparatus according to claim 9, wherein said chamber is of an exposure apparatus.

12. An exposure apparatus comprising:
a chamber;

25 a positioning apparatus provided in said chamber to position a substrate;

a substituting unit for substituting a second gas for

a first gas in said chamber;

a static pressure gas bearing used for supporting said positioning apparatus;

5 a gas supply unit for supplying a working gas to said static pressure gas bearing; and

a control unit for controlling said gas supply unit to supply the second gas to said static pressure gas bearing when substituting the gas in said chamber from the first gas to the second gas.

10 13. The apparatus according to claim 12, wherein said exposure apparatus is an X-ray exposure apparatus employing a synchrotron radiation beam as an exposure beam.

14. An exposure apparatus comprising:

a chamber;

15 a positioning apparatus provided in said chamber to position a substrate;

a substituting unit for exhausting a first gas from said chamber and introducing a second gas into said chamber;

a static pressure gas bearing provided in said chamber;

20 a gas supply pipe for supplying a working gas to said static pressure gas bearing; and

a bearing exhaust unit for exhausting a gas in said static pressure gas bearing through said gas supply pipe.

15. The apparatus according to claim 14, wherein said exposure apparatus is an X-ray exposure apparatus using a synchrotron radiation beam as an exposure beam.

16. An atmosphere substituting method comprising:
a substituting step of substituting a gas in a chamber
from a first gas to a second gas;
a control step of controlling, during the substituting
5 step, a gas supply unit to supply the second gas to a static
pressure gas bearing; and
a gas supply step of supplying the second gas to said
static pressure gas bearing with said gas supply unit.

17. The method according to claim 16, further comprising
10 an exhausting/evacuating step of evacuating said chamber by
exhausting the gas therefrom when substituting the gas in
said chamber from the first gas to the second gas.

18. The method according to claim 17, wherein the second
gas is supplied in the gas supply step before start of
15 exhausting the gas in the exhausting/evacuating step.

19. The method according to claim 17, wherein the second
gas is supplied in the gas supply step simultaneously with
exhausting the gas in the exhausting/evacuating step.

20. The method according to claim 17, wherein the second
gas is supplied in the gas supply step after start of
exhausting the gas in the exhausting/evacuating step.

21. The method according to claim 16, further comprising
a bearing exhaust step of exhausting the gas of said static
pressure gas bearing through a pipe connected thereto when
25 substituting the gas in said chamber from the first gas to
the second gas.

22. The method according to claim 16, wherein the second gas is He.

23. The method according to claim 16, wherein said chamber is of an exposure apparatus.

5 ~~24~~ A device manufacturing method including a substituting step of substituting a gas in a chamber incorporating a positioning apparatus using a static pressure gas bearing from a first gas to a second gas, and an exposure step of positioning a target exposure substrate with said 10 positioning apparatus and exposing a predetermined pattern after the substituting step, comprising:

a control step of controlling a gas supply unit, in the substituting step, to supply the second gas to said static pressure gas bearing; and

15 a gas supply step of supplying the second gas to said static pressure gas bearing with said gas supply unit.

25. The method according to claim 24, further comprising an exhausting/evacuating step of evacuating said chamber by exhausting the gas therefrom when substituting the gas in 20 the substituting step, wherein the second gas is supplied in the gas supply step before start of, simultaneously with, or after start of exhausting the gas in the exhausting/evacuating step.

26. The method according to claim 24, further comprising 25 a bearing exhaust step of exhausting, the gas of said static pressure gas bearing through a pipe connected thereto in

substituting the gas in the substituting step.

27. The method according to claim 26, wherein the gas is exhausted in the bearing exhausting step after the second gas is supplied in the gas supply step.

5 28. The method according to claim 25, further comprising a bearing exhausting step of exhausting, in substituting the gas in the substituting step, the gas of said static pressure gas bearing through a pipe connected thereto, the gas being exhausted simultaneously with exhausting in the
10 exhausting/evacuating step.

29. The method according to claim 28, wherein exposure in the exposure step is performed by using a synchrotron radiation beam, and the second gas is He.

30. A device manufacturing method comprising a substituting step of substituting a gas in the chamber by exhausting a first gas from a chamber incorporating a positioning apparatus using a static pressure gas bearing and introducing a second gas and an exposure step of positioning a target exposure substrate with said positioning apparatus and
15 exposing a predetermined pattern after the substituting step,
20 comprising:
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a bearing exhaust step of exhausting the gas of said static pressure gas bearing through a pipe connected thereto simultaneously with exhausting the gas in the substituting step.

31. The method according to claim 30, wherein exposure in

the exposure step is performed by using a synchrotron radiation beam, and the second gas is He.